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January 31, 2003

Mr. Peter H. Wulfman
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Solid Waste Management Division
County of San Bernardino
Department of Public Works
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COMMENTS ON "SOIL AND GROUNDWATER INVESTIGATION WORK PLAN, PERCHLORATE IMPACTS NEAR THE MID-VALLEY SANITARY LANDFILL," SAN BERNARDINO COUNTY, CALIFORNIA

Dear Mr. Wulfman:

We have reviewed the above referenced November 15, 2002 work plan. The work plan was submitted in compliance with the Investigation Order letter I issued on September 26, 2002. Members of the Inland Empire Perchlorate Regulatory Task Force provided comments on the work plan to us, and some of those technical comments have been addressed in this response. Comments of staff from the Department of Toxic Substances Control (DTSC) are provided as an enclosure with this letter. Based on our review, I conditionally concur with the proposed work plan, as modified by the comments included in this letter and the enclosed comments from DTSC.

The purpose of the proposed soil and groundwater investigation was discussed in detail during a November 13, 2002 meeting with the County, DTSC staff and Board staff, prior to submittal of the work plan. The purpose is to identify the contaminant source, and characterize the vertical and horizontal extent of the perchlorate and volatile organic compounds (VOCs) plumes that have been recently identified in the groundwater adjacent to the proposed Unit 5 expansion area at the County's Mid-Valley Sanitary Landfill (MVSL). Specifically, the County's proposed work plan includes:

- Excavation of up to 25 exploration borings,
- Installation of 4 permanent groundwater monitoring wells and up to 20 temporary wells,
- Chemical analysis of up to 150 soil and groundwater samples obtained from the exploratory borings and wells,

- Fate and Transport modeling of the observed release,
- Development of recommendations for interim measures that might be considered in responding to the identified release,
- Completion of a Groundwater and Soil Evaluation report,
- Development of a mitigation options report.

Background

In order to better determine the probable source and to characterize the extent of perchlorate previously detected in two MVSL monitoring wells downgradient of the proposed MVSL Unit 5 expansion area, the County installed six permanent monitoring wells (F-6A, N-1, N-2, N-3, N-4, N-5) in 2002. Each well was drilled to the B-C aquitard or into the regional groundwater production zone (C-zone). As drilling progressed within the aquifer, temporary wells were installed and discrete groundwater zones were sampled within the boreholes. After groundwater samples from the temporary wells were analyzed, permanent four-inch diameter wells were installed within the groundwater zone exhibiting the highest perchlorate concentrations. Perchlorate was present in groundwater samples obtained from monitoring wells south and southeast of the proposed MVSL Unit 5 expansion area (F-6A, N-1, N-3 and N-5), with the highest concentration of 1,000 micrograms per liter (µg/l) found in well N-3. Perchlorate was not detected in any of the groundwater samples collected from temporary or permanent wells north and northeast of the proposed MVSL Unit 5 expansion area (N-2 and N-4).

The analytical results for groundwater samples collected from these wells indicate that a source of the perchlorate exists in the vicinity of the proposed MVSL Unit 5 expansion area, and that groundwater impacts extend further south and east of these wells. Therefore, the County is proposing to install four downgradient groundwater monitoring wells. The first of the County's proposed wells (N-6) is proposed to be constructed south of Stonehurst Drive in an area likely to intercept groundwater that is downgradient of the County's property, and upgradient of the nearest known impacted production well owned by the West San Bernardino County Water District. This well (1N/5W-28J01), is located approximately 5,000 feet southeast of the proposed MVSL Unit 5 expansion area. The second monitoring well (N-7) is proposed to be placed along Alder Avenue approximately 2,000 feet south of Stonehurst Drive. This well will serve as either a sentry well for a Fontana Union production well (1N/5W-32A1) located near Highland and Alder, if no impacts are identified, or a well to delineate the lateral extent of the release, if impacts are identified. The third well (N-8) is proposed to be placed approximately 1,300 feet southeast of the existing monitoring well with the current maximum perchlorate concentrations in groundwater (Well N-3). The fourth well (N-9) is proposed to be located approximately 2,000 feet east of proposed Well N-7, and directly downgradient of Well N-8. This well will further delineate the downgradient extent of perchlorate in groundwater.

Review Comments

1. A surficial soil investigation at the Robertson's plant is proposed to include approximately ten to fifteen bucket auger borings excavated in the approximately 15- to 30-foot-high soil berm located along the southern border of the Robertson's plant, and up to five bucket auger boring excavations in the vicinity of the Robertson's aggregate plant. The borings are proposed to be advanced approximately 10 feet into the native soils, with a maximum anticipated depth of about 40 feet. Both bulk and undisturbed soil samples are proposed to be submitted to a State-certified laboratory, where they will be analyzed for perchlorate. We require that the soil collected from the bucket auger borings, i.e., representative bulk samples collected at five-foot intervals during excavation, be individually sampled and analyzed for perchlorate, and not be composited with other samples from the same bucket auger boring.

2. An investigation of Robertson's wash ponds is proposed to determine any influence these ponds may have had on the occurrence of perchlorate in groundwater in this immediate area. The investigation is proposed to include both groundwater monitoring of adjacent monitoring wells and exploratory borehole excavations through each pond, once the ponds are dried to a degree that will allow access by a drill rig. The County has negotiated a contract for the abandonment of the Robertson's wash ponds, and the wash water has already been removed from the ponds. The proposed borings in the ponds will be excavated using air rotary-casing hammer (ARCH) drilling techniques and will extend to first groundwater. Relatively undisturbed soil samples are proposed to be collected at maximum vertical intervals of 25 feet using California Modified Split Spoon and/or Standard Penetration Samplers or coring tools. Monitoring wells F-6, F-6A, N-1, N-3 and N-5 are proposed to be sampled on a monthly basis, and monitoring wells N-2 and N-4 are proposed to be sampled on a quarterly basis for a period of up to one year. This monitoring may provide insight regarding any connection between recent use of the wash ponds and the recent increase in perchlorate concentrations in groundwater in this area. We concur with the proposed investigation of the wash ponds.

3. Four new monitoring wells are proposed to be drilled to a maximum anticipated depth of 600 feet below ground surface, using ARCH drilling techniques with 11-3/4" and/or 9-5/8" diameter drive casing. These wells are intended to further define the extent of perchlorate downgradient of the area adjacent to the Unit 5 expansion area. Soil sampling is proposed to include retention of drill cuttings from the borehole and relatively undisturbed samples from the boreholes. We require that discrete soil samples be collected within 10 feet of the top and bottom of the aquitard that separates the A-zone and B-zone aquifers, to assess potential residual presence of perchlorate. These discrete soil samples should be collected using a drive barrel sampler equipped with stainless steel sleeves.

4. As the borehole for the wells approaches the anticipated depth of first groundwater, the County proposes using the blow-dry-and-wait-technique described in the work plan, at 10-foot intervals, to detect first groundwater. We request that efforts be made to assure that the first groundwater sample is collected no deeper than 10 feet below the first occurrence of groundwater. As the borehole is advanced after first groundwater is encountered, four to five additional groundwater samples are proposed to be collected by installing and sampling temporary wells (two-inch diameter, segmented, threaded schedule 80 PVC casing).

5. Based on the laboratory analytical results for samples collected from the temporary wells, the most impacted groundwater zone is proposed to be identified, and a permanent monitoring well is proposed to be installed in that zone. Wells are proposed to be constructed using five-inch I.D., schedule 80 PVC casing and screen. Centralizers are proposed to be used to position the monitoring well screen within the borehole. Well screen intervals are proposed to be 20 to 30 feet in length. We request that the well screen intervals not exceed 30 feet in length. In the event that the screened interval is placed across first water, sufficient well screen must be placed below the water table to assure that wells will not become prematurely dry. Selection of the well screen depth and interval for the monitoring well must be made in consultation with Board staff.

6. We concur with the location of the four proposed wells. However, please install a two-inch I.D. piezometer next to each monitoring well for measuring water levels in the C-zone. Also, please include in your evaluation report, copies of the groundwater elevation contours in both the shallow aquifer and the top of the regional aquitard, as previously provided in the November 13, 2002 Geologic Associates presentation to DTSC and Regional Board staff.

7. We concur with the collection of groundwater samples from each of the newly installed wells and piezometers, using the decontamination, purging and sampling techniques, as described in the work plan.

8. Groundwater samples are proposed to be submitted to a state-certified testing laboratory for analysis of perchlorate by USEPA Method 314.0 and VOCs by USEPA Method 8260. We request that groundwater samples collected from permanent wells that are impacted with perchlorate also be tested for N-nitrosodimethylamine (NDMA) using USEPA Preparation Method 3520C and USEPA analytical method 1625M or an equivalent method approved by the California Department of Health Services, with a reporting limit of 2.0 nanograms per liter. We request that groundwater samples also be tested for general water chemistry parameters.

9. In order to better understand the hydraulic characteristics of the alluvial aquifer in the vicinity of the eastern area of the County's property, slug and bail tests and aquifer pumping tests will be performed following installation of the permanent wells. In

addition, one relatively short-term (up to 24 hours) pumping test will be performed. As part of the short-term test, the selected well will be evaluated by completing a variable-rate step-drawdown test to assess aquifer conditions. Please notify Board staff at least seven days prior to commencement of the 24-hour test, so that we can arrange to be present and observe aquifer testing procedures.

10. The County proposes to conduct a risk-based assessment of potential remedial responses in order to determine whether an active remedial response to the locally degraded groundwater condition is warranted at distance from the source or in order to limit the extent of the ultimate corrective action. We have no objection to the County performing a risk-based assessment. However, please be aware that a comprehensive risk-based assessment may only be possible after the extent of the perchlorate impacts from the County's Rialto property have been completely delineated.

11. We have no objection to the County performing the proposed groundwater modeling. However, the modeling of the extent of the perchlorate impacts to the local production wells may be incomplete unless appropriate data are included after the perchlorate plume has been completely delineated.

Based on the results of the field investigations, the need for additional investigations will be evaluated. As noted in your work plan, your evaluation report containing the findings of the field investigation will identify any data gaps, and work plans will be prepared to supplement the data.

At our request, a revised time schedule for implementation of the work plan was submitted on January 30, 2003 (Attachment 2). The schedule was revised to allow for the time that was necessary for preparation of comments by our staff, DTSC staff, and other interested parties. We concur with your proposed, revised time schedule for implementing the work plan. By February 14, 2003, please confirm your intent to implement the comments provided in this letter, and provide a response to the enclosed comments from DTSC.

Implementation of this work plan is a requirement of Cleanup and Abatement Order No. R8-2003-0013, which was adopted by the Regional Board on January 17, 2003. Failure to implement this work plan in accordance with the revised time schedule in Attachment 2 of this letter would be a violation of the Cleanup and Abatement Order, and would subject the County to civil monetary penalties.

Also, please be aware that the need for additional site investigation of the soil and groundwater on the adjacent County-owned property is currently being evaluated with the assistance of the DTSC staff, and other members of the Inland Empire Perchlorate Regulatory Task Force. We will provide you with additional information regarding this issue when our evaluation is complete.

Please notify the following individuals at least 24 hours prior to all field work to allow for inspection and oversight as needed: Kamron Saremi, RWQCB (909) 782-4303; Wendy Arano, DTSC (714) 484-5480; and Peter Murphy, Kennedy/Jenks Consultants - Perchlorate Task Force (949) 261-1577.

If you have any questions, please contact Ann Sturdivant, Chief of our Spills, Leaks, Investigations and Cleanups Section, at (909) 782-4904, or you may call Robert Holub at (909) 782-3298.

Sincerely,

Gerard J. Thibeault
Executive Officer

Attachments:
Work Plan Comments from DTSC
Revised Time Schedule for Work Plan Implementation

cc: w/attachments:
Regional Board
Jorge Leon, SWRCB, Office of Chief Counsel
Wendy Arano/Christine Brown, DTSC (Cypress Office)
Gary Lass, GeoLogic Associates (San Bernardino Office)
Inland Empire Perchlorate Regulatory Task Force Members (mailing list attached)

AES:Data/SLIC/01-03 Rialto perchlorate/13267/wkplan sb01-31-03

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MEMORANDUM

TO: Ann Sturdivant, Chief
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FROM: Wendy Arano, R.G.
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DATE: December 17, 2002

SUBJECT: Comments on "Perchlorate Impacts Near Mid-Valley Sanitary Landfill - Soil and Groundwater Investigation Workplan" prepared by the County of San Bernardino, Solid Waste Management Division and dated November 15, 2002

Introduction

The purpose of this workplan is to provide the scope of work for further characterization of perchlorate and volatile organic compound contamination in soil and groundwater

adjacent to the Northeast Expansion Area of the Mid-Valley Sanitary Landfill. Specifically, the workplan includes excavation up to 25 exploration borings, installation of up to 20 temporary and 4 permanent groundwater monitoring wells, chemical analysis of up to 150 soil and groundwater samples and Fate and Transport modeling of the observed contamination.

The Department of Toxic Substances Control has reviewed the workplan and has the following comments:

1. The workplan refers to "E-" wells, but does not show the location of these wells on any figure. A figure should be submitted that clearly shows where these wells are or will be located.

2. On pages 8 and 9 the County offers their opinion that the Mid-Valley Landfill is not a source of perchlorate based of the County's interpretation of the data collected to date. DTSC has not issued a decision of the source of perchlorate and reserves judgement as to the sources of perchlorate until additional data is available. It is very likely that more than a single source of perchlorate is present in the area.

3. On page 12, the County proposes that an aquifer test of to 24 hours will be conducted. DTSC is of the opinion that a longer-term test may be required (72-hours or one week). The County should indicate if aquifer tests have been completed at the landfill area previously (either by the County or by the water purveyors or by the U.S. Geological Survey) and, if so, what length of test was needed to gather useable data.

4. On page 15, section 2.4.1 discusses a "risk assessment" to be done, but does not provide details of the methodology for the risk assessment or the specific results to be obtained. DTSC requests that the additional details be provided for review prior to the County conducting the risk assessment.

5. The workplan does not adequately address the investigation of the original Broco site for final closure. Additional sampling is needed to address all hazardous waste management units and solid waste management units at the original Broco location.

6. Although appropriate constituents of concern are mentioned in Table A-1, the text providing specific description of soil borehole sampling on pp. A3-A4 and groundwater sampling on p. A7 does not specifically reference Table A-1, making it unclear whether all soil and groundwater samples will be sampled for all constituents.

7. A specific analytical method should be referenced for n-nitrosodimethylamine (NDMA) in Table A-1.

3.0 PROJECT SCHEDULE

The anticipated schedule for completing the work described above is presented below. Of particular note, the anticipated project schedule is predicated by the assumption that drilling during the coming winter will not be adversely impacted by seasonal precipitation. Although every effort will be made to keep the project schedule "on track", it is possible that severe storms could delay drilling activities.

The following milestones in the proposed schedule are critical to the prompt completion of the project work:

- Surface Soils Investigation - Completed by February 28, 2003
- Investigation of Robertson's Wash Ponds – Completed by December 31, 2003.
- Identification of Other Nearby Sources – Completed by August 30, 2003
- Investigation of Lateral Limits - Completed by May 30, 2003.
- Modeling of Alder Release – Completed by June 30, 2003.
- Evaluation Report – Submitted by July 31, 2003.
- Risk Based Assessment – Completed by August 15, 2003.
- Identification of Alternatives – Completed by August 31, 2003.
- Verification of Permit Requirements – Completed by September 30, 2003.
- Technical and Cost Analysis and Ranking – Submitted by October 31, 2003.
- Mitigation Alternatives Report – Submitted by December 31, 2003.
- Amended JTD for Corrective Action – Submitted by January 31, 2004.
- Recommendations for Interim Remedial Action – As Needed

4.0 CLOSURE

This Work Plan is based on the limited data described above and referenced herein. GeoLogic Associates should be notified of any conditions that differ from those described herein since this may require a re-evaluation of the work-plan elements presented herein. This Work Plan has not been prepared for use by other parties and projects other than those named or described above. It may not contain sufficient information for other parties or other purposes.

This Work Plan has been prepared in accordance with generally accepted geotechnical and hydrogeologic practices, and makes no other warranties, either expressed or implied, as to the professional data presented in it.

GeoLogic Associates

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